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ABSTRACT

The relationship between prior educational attainment and participation in formal and On-the-Job Training (OJT) in Australia was examined through an analysis of unit record data from the 1993 Survey of Training and Education that was conducted by the Australian Bureau of Statistics. Univariate analyses were performed to document employee participation by level of educational attainment in three different types of training activities: external training, in-house training, and OJT. Multivariate analyses were then conducted to separate the effect of educational attainment from other variables (for example, age and occupation) that might affect training participation. Educational attainment was found to have a significant impact on employee participation in both formal and on-the-job training. Low levels of participation in training were particularly evident for individuals who had not completed secondary school and who held no postschool educational qualifications. Females, individuals in the 30-44 age bracket, individuals born in Australia or other English-speaking countries, individuals with their current employer for fewer than 3 years, individuals working in the public sector, and full-time employees in nonmetropolitan rural locations were most likely to participate in training. (Five tables and two graphs constitute approximately 50% of this document. (Contains 16 references.) (MN)

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CENTRE FOR THE ECONOMICS OF EDUCATION AND TRAINING

EDUCATIONAL ATTAINMENT and PARTICIPATION IN TRAINING

Phillip McKenzie and Mike Long

October 1995

WORKING PAPER NO. 4

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Educational Attainment and Participation in Training

Phillip McKenzie and Michael Long

Introduction

This paper examines the relationship between prior educational attainment and participation in formal and on-the-job training in Australia. The evidence suggests that the incidence of participation in formal training courses by those with the highest levels of educational attainment was substantially greater than for those with no post-school qualifications. It would seem that the uneven distribution of educational qualifications among employees in Australia is mirrored in the distribution of training activities.

Employee participation in training can be important for skills and career development, for adapting to technological change, and for attaining higher earnings. As discussed later in the paper, there is extensive conceptual debate about the role that training plays in accounting for the fact that the age-earnings profiles of the better educated typically rise faster, and reach higher levels, than the profiles of those with lower levels of educational attainment. Nevertheless, recent empirical work suggests a strong linkage between firm-based education and training and earnings growth. In these terms the issue of who gains access to training, and the role that education plays in shaping that access, raises important efficiency and equity concerns.

This paper draws on unit record data from the 1993 *Survey of Training and Education* (STE) conducted by the Australian Bureau of Statistics (ABS). Univariate analyses are used to document employee participation by level of educational attainment in three different types of training activities. Multivariate analyses are then used to separate the effect of educational attainment from other variables (such as age and occupation) that could be expected to affect training participation.

Conceptual and Empirical Background

Education and training activities that raise individuals' future earning capacities are a form of investment in capital resources. Depending on the timing and nature of the education or training activity concerned, the costs of providing education and training are shared, in varying proportions, by individuals, enterprises and government. A key distinction between education and training

is that, in general, enterprises will have more influence on the quantity and nature of individuals' training than on their employees' formal educational attainment.

Enterprises will be more likely to invest in training when they have reasonable prospects of recouping the benefits of that training. According to Becker (1964), this is most likely to occur when the training is specific to the enterprise concerned, and cannot be readily captured by other enterprises. As a corollary, enterprises in competitive markets will only provide general training if they do not have to bear the costs. Employees are willing to pay for general training in the form of lower wages in the training phase if it has the potential to raise their future earning capacity. In effect, employees buy general training from employers, and prefer to do this via workplace training rather than formal education if the complementarity between work and learning makes this a more efficient approach (Stern, 1994).

Broadly speaking, formal education and employment-based training may be either substitutes or complements in the formation of productive skills and knowledge. If training is a substitute for formal education, then training has the potential to reduce the income inequalities associated with differential educational attainments in the labour force (Tilak, 1994). On the other hand, if education and training are complements then employment-based training would tend to increase income inequality. There are strong conceptual and empirical grounds for viewing education and training as complements, rather than as substitutes.

In terms of Becker's dichotomy between specific and general training, it is unlikely that the skills and knowledge needed to meet the specific needs of particular enterprises could be satisfactorily acquired through formal education. Employers are willing to finance specific training, Becker argues, because such training does not necessarily increase employees' earning capacity in other settings. Since formal education is likely to have a positive effect on the speed and extent to which employees absorb specific training, and thereby reduce employers' training costs, it could be anticipated that there will be a positive relationship between prior educational attainment and participation in firm-specific training activities.

In regard to general (non firm-specific) training there are a number of aspects of skill formation where such training and formal education are like to be close substitutes. Examples would be the development of literacy, numeracy and keyboarding skills. Each of these could be acquired through either formal education or employment-based training, and there would be no need for those who commence employment already possessing these skills to receive additional training in them. There are other forms of general training though - such as in clerical procedures or management techniques - for which formal education may provide only a limited introduction. In such instances employment-based training may be needed to supplement or complement formal educational experiences, and a positive relationship between education and training participation could be anticipated.

Becker's conclusion that workers pay for their own general training has been questioned in a number of empirical studies. Glick and Feuer (1984) argued that employers finance general training to encourage employees to participate in specific training. Bishop (1991) concluded that employers are willing to finance general training because different firms require different combinations of general training, and that therefore other firms may not give full credit for such training. Katz and Ziderman (1990) argued that in any instance it is difficult for other firms to obtain adequate information about the general skills and capacities of potential employees, unless these are formally certified. Therefore, to the extent that substantial parts of what Becker had conceptualised as general training are in fact paid for by firms, the complementarity between formal education and training would become even stronger.

Those theorists who reject Becker's human capital approach to skills formation also see a strong positive relationship between educational attainment and participation in training. The alternative view is provided by the screening theorists and advocates of the job queue model such as Thurow (1975). According to this view, workers wish to move up the labour queue as this is the only way that they can gain access to jobs with the best training ladders and therefore improve their earnings prospects. Educational attainment is one of the few characteristics that potential employees can alter. Therefore, education becomes one of the best methods of signalling ability to employers. Potential employees who are perceived to have high ability are presumed by employers to incur lower training costs. For example Barron *et al* (1989) found that the number of applicants screened for a job increases with the amount of on-the-job training required, and that educational attainment is one of the key factors in the screening process. Thus, one interpretation of the screening model is that observed returns to education and training represent information gains rather than productivity gains (Chapman, 1993).

Those whom place more weight on institutional factors in determining job mobility and earnings growth also hypothesise a positive relationship between education and training. In occupations and enterprises characterised by strong internal labour markets, training provides a mechanism for workers to achieve promotion primarily within the firm. Sicherman & Galor (1990) conclude that, due to a greater amount of occupation-specific investment in training, more educated individuals have careers that involve a smaller number of distinct occupations and are therefore less likely to change occupations (and firms). Within a given occupation, however, more educated individuals are more likely to move to a higher level occupation within or across firms. Thus, to the extent that training enhances visibility and mobility, better educated individuals will have stronger incentives to take up training opportunities than less well educated workers.

Estimation of the impact of training on productivity and earnings is more difficult than for education because of greater heterogeneity in training experiences, quantity of training and the age at which training is received. Stern (1994) summarised a body of US and European empirical studies that support the conclusion that firm-based education and training leads to higher earnings

over time, although the precise causal relationships are unclear. Longitudinal Australian data on the relationship between training and wages for young workers were analysed by Chapman and Tan (1992). They concluded that there was a positive relationship between the incidence of participation in training and wage growth, although the return fell with the length of time since training which implies depreciation of the value of training. Importantly, Chapman and Tan concluded that formal training has a much larger impact on wages in industries experiencing rapid technological change. Barron *et al* (1989) concluded that about half the returns to training are received by workers, which implies that the costs are also likely to be shared. Greenhalgh and Stewart (1987) argued that although training is a joint decision between employer and worker, certain worker characteristics - notably age, gender, and qualifications - do affect the amount of training participation over and above occupational or enterprise factors.

The structural characteristics of national economies and education and training systems also seem to play a role. The cross-national study of training statistics by the OECD (1991) indicated that in the USA the highest educated workers were almost 6 times more likely to receive formal company training compared with less educated workers. The broadly comparable ratios for Sweden and Japan were 2 and 1.3 respectively. Compared to the USA both of these countries have substantially higher levels of overall worker participation in formal training. Where overall training levels are low, it could be expected that educational background would play a more important role in rationing access to available training opportunities.

The preceding discussion suggests that who gets access to training will be influenced by a variety of factors including personal background variables such as educational attainment and age, occupational characteristics and experience, and enterprise characteristics. Multivariate analyses of the relative contributions of these factors have found that prior educational attainment plays a key role.

The analysis of the 1989 ABS survey of training by Baker and Wooden (1992) found that, after controlling for a wide range of other variables, the probability of participating in training rose with the level of educational attainment. They concluded that "by implication, the desire and aptitude for training as well as its cost-effectiveness are more important than worker needs" (Baker & Wooden, 1992, p. 36), and that "if left to the private sector, the skill levels of the more educated will continue to rise while the less educated will remain little affected" (p. 44).

Using data on the education and labour market experiences of 19-26 year-old Australians, multivariate analyses by Miller and Volker (1987) generated broadly similar conclusions: "education and on-the-job training appear to be complementary sources of human capital skills ... Education, therefore, appears not only to provide direct rewards such as higher wages and lower unemployment rates, but also to increase access to training opportunities" (p. 51).

The present paper applies similar analytical techniques to the most recent, and most comprehensive, Australian database to examine the impact of prior educational attainment on participation in a variety of training activities.

Data Source

The STE was based on the labour force part of the monthly population survey conducted by the ABS in April and May 1993. It was restricted to 15-64 year-olds. Face-to-face interviews were used to collect data on a wide range of demographic, labour market, education and training variables. An overview of the survey is provided by ABS (1994) which also provides key summary statistics. An effective sample of 12 600 households was used, which generated 24 500 completed interviews. The unit record data used in the following analyses contain information on 20 900 persons.

The 1993 STE was broader in scope than the comparable 1989 ABS survey, *How Workers Get Their Training*. As well as data on wage and salary earners the 1993 survey included information on the unemployed, those marginally attached to the labour force, employers, and the self-employed. Figure 1 shows the distribution of these groups within the data set. For this initial examination of the data, analyses are confined to those wage and salary earners classified as full-time, permanent employees. Under the ABS definitions, this group comprised those wage and salary earners who at the time of the survey reported that they usually worked 35 hours or more per week in their job with their main period employer, and whose employment conditions included paid sickness and holiday leave. Full-time, permanent employees comprised 9309 persons or 45 per cent of respondents on the STE unit record file. In weighted terms this is equivalent to a population of some 4.25 million. For ease of expression, this group will be referred to as full-time employees.

The reason for focussing on this particular sub-group is that there are reasonable grounds for expecting that the training experiences of the unemployed, employers and the self-employed would differ from those of employees. Further, within the employee category, analyses of earlier data sets (Miller & Volker 1987; Baker & Wooden 1992) have shown that, compared to full-time workers, part-time and casual employees experience much lower levels of training, and have a much greater variety of working conditions and hours worked. Full-time, permanent employees provide a more homogenous group with which to study the impact of educational attainment on training. One consequence of confining the analyses to this group, though, is that within-group variability is reduced compared to analyses that look at either employees as a whole or the labour force as a whole. Hence the explanatory power of any models tested on this sub-group tend to be lower because much of the variation in training experiences has been removed.

Types of Training

STE respondents were asked to supply data on training courses and on-the-job training they had experienced during the previous 12 months. Training courses were defined as 'training activities which are designed and/or undertaken to maintain, develop or learn skills related to job performance and/or competency [and which] consist of periods of instruction or a combination of instruction and monitored practical work' (ABS, 1994, p. 60). For simplicity of presentation, data on external and in-house training course are combined in the present paper.

- *External training*. This was attendance at a training course organised and conducted by agencies other than the respondent's employer. Study for an educational qualification was excluded from this category.

- *In-house training*. This referred to courses organised by the respondent's employer primarily for their own staff and using the employer's staff or training consultants.

- *On-the-job-training*. In the STE survey on-the-job training is defined as unstructured training, that is, training that does not involve a formal course or study for an educational qualification. Respondents were asked whether any of the following activities were undertaken to improve their jobs skills while employed in any job over the previous 12 months:
  - being shown how to do the job;
  - watching others work (including examining other workers' product);
  - asking questions of co-workers; and
  - teaching self.

The remainder of the paper is concerned with the effect of prior educational attainment on the extent to which full-time employees participate in these forms of training.

Analytical Technique

Results are presented as means and percentages for the various measures of the extent of participation in training. In all instances the means and percentages are weighted to ensure that the sample results more accurately reflect the population.

As well as simple or observed means and proportions, adjusted means and proportions are presented. These are derived from ordinary least squares regression equations in which the categories of the background variables (sex, age, country of birth, highest educational attainment, occupation, time in occupation, time with employer, sector, industry, size of firm and location, and geographic location) have been entered as predictors. Such a model requires that one category of each variable be omitted. The use of categorical variables is necessary given the nominal nature of some of the variables and the presence of

curvilinear relationships between training and at least some of the interval scaled variables.

The adjusted means and percentages for a given variable are determined by preserving the size of the effects identified in the regression equation and imposing the restraint that the sum of the adjusted means for a given variable weighted by their percentage of the sample in the relevant category is equal to the overall mean or percentage. The essence of the procedure remains with the regression equation which underlies the adjustment. The means are 'adjusted' only in the same sense that regression coefficients are adjusted. They reflect the effect of one variable on some dependent variable, controlling for the effects of whatever other variables may be in the regression equation.

As a device for presentation, however, this approach has two positive features compared with the use of the regression coefficients. First, the focus of discussion remains on the overall level of whatever dependent variable is being examined. Second, regression coefficients require the arbitrary omission of one category within each variable and the coefficients for the included category are all compared with the omitted category. The approach used here re-introduces a mean or percentage for the omitted category into the results and does not give any particular category some form of comparative superiority.

Estimates of the standard errors of both the observed and adjusted means and percentages are provided. These were calculated by boot strapping techniques. The standard errors provide an indication of the stability of the estimates of the means and percentages. They do not always provide a good indication of the statistical significance of the difference between categories because the categories are not independent.

Results of the Analyses

The results are discussed in three main sections:

- the incidence of participation in formal training courses;
- the number of courses and hours involved in formal training; and
- the incidence and main forms of on-the-job training.

The discussion focuses on the impact of educational attainment on training participation. Later in the section a summary is provided of other important influences on training participation revealed by the analyses.

The Incidence of Formal Training

Table 1 records the observed and adjusted proportions of full-time employees who reported that they had participated in a formal training course during the previous 12 months. The statistical adjustments control for the effect of the other variables in the table. The effect of the adjustments is usually to reduce

the observed differences between groups. For example, one of the reasons why employees with postgraduate qualifications are observed to have relatively high levels of formal training is that they tend to work in managerial and professional occupations, which are areas of employment in which formal training is high. The statistical adjustment controls for the effect of other variables. The model fitted in Table 1 explains 20 per cent of the variance in participation in formal training.

Across full-time permanent employees as a whole, the reported incidence of participation in a formal training course during the previous 12 months was 44 per cent. The table shows that much of the observed greater incidence of formal training participation by well-educated employees is due to factors other than their educational attainment. For example, after adjustment the participation of those with postgraduate qualifications declined from the observed level of 73 per cent to 56 per cent. Correspondingly, the adjusted level of participation of those with the lowest level of educational attainment was some 6 percentage points higher (34.6 per cent compared to the observed level of 28.4 per cent). The tendency of well-educated employees to be younger and to work in occupations and industries with relatively high formal training explains much of the observed training differential.

Nevertheless, even after the statistical controls, Table 1 indicates that there is still a strong positive relationship between highest level of educational attainment and participation in formal training courses. Other factors equal, at least 55 per cent of those holding one of the three highest levels of qualifications participated in a formal training course. This was around 1.25 to 1.6 times a higher incidence of participation than those whose qualifications did not extend beyond Year 12. It would seem that, over and above characteristics of the job, possession of relatively high educational qualifications stimulates employees to demand formal training or employers to supply it, or both.

The notable exception to the general pattern is provided by full-time employees who hold skilled vocational qualifications. (The ABS defines this category to be a course where the entry requirement is usually Year 10 or its equivalent, 2 to 4 years study is required, and some on-the-job training is usually required, such as in an apprenticeship.) Their participation in formal training is lower than would be expected given the level of their educational qualifications. Baker and Wooden (1992) reached a similar conclusion from their analysis of 1989 ABS data. It may well be that skilled vocational qualifications are sufficiently well oriented towards employment that the need for job-based training is reduced.

Number and Hours of Formal Training Courses

Tables 2 and 3 document participation in formal training in terms of the number and hours of courses participated in during the previous 12 months. The fitted model explained 16 per cent of the variation in the number of courses, and 13 per cent of the variation in the number of hours.

Full-time employees as a whole reported that they had attended an average of 1.8 training courses during the previous 12 months. In total, those courses involved an average of 23 hours of training per full-time employee. As Tables 2 and 3 show, there was a strong positive relationship between formal educational attainment and the amount of formal training that was received.

After controlling for other variables, those who held the highest educational qualifications participated in at least one more training course per year than those with no post-school qualifications, and the courses attended by the well educated involved at least 30 per cent more total training time. Once again, those classified as holding skilled vocational qualifications appear to have relatively low levels of participation as measured by the number and hours of formal training courses.

The data reported in these two tables refer to all full-time employees, not just those who reported participating in formal training. When only those who participated in a training course are considered, the differences between levels of educational attainment in the average number of hours attended is far less marked. (These analyses are not included in the present paper.) For example, among this sub-group the adjusted number of hours of training courses was 53.6 hours for those with postgraduate qualifications, and 47.6 hours for those with only some secondary education. Once employees gain access to formal training, educational attainment becomes a less critical influence on the amount of training they receive.

On-the-job Training

As may be expected with the broad definition of on-the-job training used in the ABS survey, 85 per cent of full-time, permanent employees reported having experienced on-the-job training during the previous 12 months. The data are reported in Table 4. The model accounted for 14 per cent of the variance in participation in on-the-job training.

Given that there was relatively little variation in the incidence of on-the-job training, the impact of educational attainment after statistical adjustment was fairly muted. Nevertheless, it was still there. Other factors equal, those with higher levels of educational attainment reported a greater incidence of participation in on-the-job training than those with lower educational qualifications. When combined with the data on formal training, this implies a widening skills base between well-educated and other employees.

Figure 2 attempts to go beyond the aggregate data by examining the main forms of participation in on-the-job classified by highest level of educational attainment. To simplify the presentation the categories "being shown how to do the job" and "watching others work" have been combined into "watching". There was little difference among the groups in terms of reporting asking questions about their work: this was about 20 per cent for all groups. In

general, the higher the level of educational attainment, the more likely were people to report on-the-job training in the form of "self-teaching", and less likely to report that the main form was "watching". For example, 78 per cent of those with postgraduate qualifications who reported participating in on-the-job training indicated that its main form was self-teaching, compared to 50 per cent of those with Year 12 qualifications and 57 per cent of those with some secondary education. Only 5 per cent of postgraduates reporting on-the-job training indicated that its main form was "watching", compared to 36 per cent and 24 per cent respectively for the other two groups.

Prior educational attainment is reflected in the ways that people learn at work. Those with higher levels of educational attainment are more likely to teach themselves, and to rely less on other colleagues in their unstructured learning activities. This finding may provide support for the argument that the costs of training are lower for those with high levels of educational attainment.

Other Influences on Training

This section summarises the relationships between non-education variables and participation in training. It is drawn from Tables 1 to 4, and the summary provided in Table 5. In the main, the pattern of results is similar to that reported by Baker and Wooden (1992) from their multivariate analyses of the 1989 ABS training survey.

Sex. On average, female full-time employees participated in slightly more training courses than males, other factors equal, but participated in fewer formal training hours overall.

Age. In general, participation in training increased with age up to the 30-44 age bracket, after which it declined. The relationship between training and age would probably best be modelled by a quadratic form.

Country of birth. On all training measures those born in Australia or another English-speaking country received more training than those born in a non-English speaking country.

Occupation. Participation was positively related to occupational status. Those working in the trades tended to have relatively low participation in training, and those working in sales and personal occupations had higher levels of participation.

Time in Occupation. Generally speaking, the longer a person had been working in an occupation, the greater their participation in training.

Time with Employer. In terms of participation in formal training, and total hours of training courses, those who had been with their current employer for less than 3 years tended to have relatively high participation in training, whereas those with more than 10 years were relatively low, on average.

Sector. Those working in the public sector were more likely to participate in formal training than those in the private sector. However, after the statistical controls it was found that there was no statistically significant difference between the two groups in terms of training courses or training hours.

Industry. There were some significant differences between industry groups. In general training participation tended to be relatively high in mining and agriculture, and in the group comprising public administration, defence, and health, education and welfare. Training participation was relatively low in manufacturing, and in the retail and wholesale sector, other factors equal.

Size of firm. There was a positive relationship between the size of the firm (measured by the number of employees) and training participation. However, the number of employees working at the particular location at which people were employed had no impact on training participation.

Location. Full-time employees working in non-metropolitan rural locations had a higher probability of participation in formal training than those in metropolitan areas, but on average there was no significant difference between the two groups in either the number of training courses or course hours attended.

Further research is required to identify factors that influence participation in training other than those that have been used in the present analyses. Datasets that allow more extensive analyses of the enterprises in which people work, and patterns of work organisation and technology use, would be fruitful avenues to explore.

Conclusion

There are strong conceptual and empirical grounds for viewing formal educational attainment and employment-based training as complementary. This paper has provided further support for this view through a multivariate analysis of unit record data from the 1993 ABS *Survey of Training and Education* . After controlling for a wide range of personal background, occupational, industry and enterprise characteristics, educational attainment was found to have a significant impact on employee participation in both formal and on-the-job training.

Low levels of participation in training were particularly evident for those who had not completed secondary school and who held no post-school educational qualifications. A large majority of these people reported no participation in formal training at all during the previous 12 months. This group, which comprised almost one-third of full-time employees, had an adjusted level of participation in formal training that was around 20 percentage points lower than for those with undergraduate or postgraduate qualifications. On average, those who had not completed secondary school participated in around 1.5 fewer training courses and about 15 fewer training hours per year than those with

undergraduate or postgraduate qualifications. Even in regard to on-the-job training, the reported incidence of participation was some 7 percentage points lower for those who had not completed secondary school compared to those with the highest level of qualifications. Although training statistics do not capture all, or perhaps even most, of the learning that occurs in workplaces the markedly lower level of participation in formal training by those with the least education raises important policy issues.

The analyses provide support for those educators who point to the role that education plays in helping to equip people to continue learning throughout their lives. It would seem that there are factors associated with high levels of educational attainment that lead to training participation over and above the requirements of the jobs concerned. Since there is also strong evidence that training is associated with productivity and earnings growth, the high level of participation in training by the already well educated has adverse implications for income inequality.

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Table 1 *Participation in Formal Training in the Previous 12 Months: Full-time Permanent Employees, 1993*

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	se	%	se	
Sex						
Male	65.4	41.6	0.7	43.5	0.7	5934
Female	34.6	48.9	0.9	45.3	0.8	3375
Age						
15-19	4.6	21.7	2.1	38.0	2.5	398
20-24	14.6	39.4	1.5	42.2	1.5	1287
25-29	15.5	44.1	1.4	43.9	1.3	1420
30-44	40.5	50.2	0.9	47.5	0.8	3901
45-55	18.7	43.9	1.1	42.5	1.1	1740
56-65	6.1	32.8	2.0	36.9	1.9	563
Country of birth						
English-speaking	86.2	46.5	0.6	45.9	0.5	8109
Non-English-speaking	13.8	29.4	1.3	33.0	1.5	1200
Education						
Postgraduate	5.8	73.2	2.0	56.2	2.3	566
Bachelor's degree	10.9	67.5	1.5	57.3	1.7	1055
Undergraduate diploma	3.9	69.7	2.3	54.7	2.0	370
Associate diploma	7.5	54.7	2.1	50.2	1.9	715
Skilled vocational	19.1	37.9	1.4	44.1	1.4	1720
Basic vocational	5.7	50.8	2.6	46.0	2.7	521
Final year secondary	15.5	42.5	1.4	43.6	1.3	1446
Some secondary	31.6	28.4	0.8	34.6	1.0	2916
Occupation						
Managerial	9.5	57.6	1.8	53.4	1.8	900
Professional, Para-prof & Tech.	24.4	65.8	1.1	51.6	1.3	2336
Trade	15.7	28.6	1.3	38.8	1.5	1389
Clerical	18.4	46.8	1.3	45.6	1.3	1774
Sales & personal	10.9	44.3	1.7	51.5	1.7	1001
Operator	9.4	25.4	1.6	33.0	1.7	851
Labourer	11.7	19.5	1.2	27.8	1.5	1058

Continued

Table 1 *Participation in Formal Training in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)*

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	*se*	%	*se*	
Time in occupation						
Less than 3 months	2.3	25.3	2.9	31.6	3.4	223
3 months & under 6 months	3.1	30.6	3.2	37.0	3.0	279
6 months & under 1 year	6.5	33.9	2.0	39.1	1.9	595
1 year & under 2 years	9.9	40.4	1.7	40.3	1.7	934
2 years & under 3 years	9.4	43.8	1.8	42.6	1.7	871
3 years & under 5 years	19.4	44.6	1.1	44.5	1.2	1768
5 years & under 10 years	23.3	45.3	1.2	44.8	1.2	2180
10 years & under 20 years	17.8	49.5	1.3	47.8	1.3	1688
20 or more years	8.3	51.4	1.9	50.2	1.7	771
Time with employer						
Less than 3 months	2.7	37.8	2.8	48.4	3.6	252
3 months & under 6 months	3.1	38.2	2.9	45.1	3.3	284
6 months & under 1 year	4.9	39.9	2.3	45.2	2.4	463
1 year & under 2 years	8.5	46.8	2.0	48.0	1.7	790
2 years & under 3 years	8.3	49.0	1.8	48.2	1.7	777
3 years & under 5 years	17.8	46.5	1.2	46.0	1.2	1628
5 years & under 10 years	23.5	43.8	1.1	43.6	0.9	2185
10 years & under 20 years	19.9	44.0	1.2	40.9	1.2	1875
20 or more years	11.3	40.8	1.5	40.4	1.7	1055
Sector						
Public	32.7	60.7	1.0	47.2	1.1	3299
Private	67.3	36.1	0.6	42.6	0.7	6010
Industry						
Mining & agriculture	3.3	42.9	2.9	49.5	2.7	314
Manufacturing	20.4	28.1	1.0	38.1	1.3	1767
Utilities & construction	6.7	37.0	2.0	45.8	1.9	596
Retail & wholesale	16.9	34.1	1.2	40.8	1.6	1519
Transport & communication	7.6	43.8	2.1	43.6	1.9	705
Finance, insurance & property	11.8	50.7	1.6	46.5	1.4	1052
Pub. admin, defence, HEW	26.6	62.3	1.1	49.2	1.2	2919
Entertainment	4.7	34.4	2.3	40.6	2.4	437
Size of firm (No. employees)						
Less than 10	12.1	19.5	1.1	27.1	1.9	1084
10-19	6.1	27.6	1.9	32.8	2.3	565
20-99	13.5	38.8	1.4	41.6	1.5	1243
100 or more	68.3	51.0	0.6	48.7	0.7	6417

Table 1 ***Participation in Formal Training in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)***

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	se	%	se	
Size of loc. (No. employees)						
Less than 10	19.2	29.8	1.1	43.0	1.6	1749
10-19	11.8	39.7	1.5	45.4	1.8	1115
20-99	29.0	45.8	1.0	43.1	1.1	2694
100 or more	40.0	51.1	0.8	45.1	0.9	3751
Location						
Metropolitan	69.1	44.0	0.6	43.3	0.6	6594
Non-metropolitan	30.9	44.3	1.1	45.9	0.9	2715

Notes:

1 *Formal training comprises external and in-house training courses.*

2 *Small proportions of missing responses for Size of firm, Size of location and Sector were dealt with by random imputation.*

3 *Adjusted means are derived from a regression equation which fits the categories of the all the variables included in the table.*

4 *The standard errors (se) are bootstrap estimates and provide an indication of the stability of the means.*

5 *The N values are actual counts of respondents and generally will not correspond to the weighted proportions.*

Table 2 *Number of Training Courses During the Previous 12 Months: Full-time Permanent Employees, 1993*

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	mean	se	mean	se	
Sex						
Male	65.4	1.62	0.04	1.69	0.04	5934
Female	34.6	2.00	0.06	1.87	0.06	3375
Age						
15-19	4.6	0.66	0.11	1.67	0.14	398
20-24	14.6	1.36	0.08	1.71	0.09	1287
25-29	15.5	1.73	0.09	1.77	0.08	1420
30-44	40.5	2.08	0.06	1.89	0.05	3901
45-55	18.7	1.82	0.08	1.64	0.08	1740
56-65	6.1	1.19	0.11	1.29	0.11	563
Country of birth						
English-speaking	86.2	1.85	0.04	1.83	0.04	8109
Non-English-speaking	13.8	1.14	0.08	1.26	0.08	1200
Education						
Postgraduate	5.8	3.65	0.21	2.77	0.19	566
Bachelor's degree	10.9	3.32	0.13	2.78	0.14	1055
Undergraduate diploma	3.9	3.68	0.22	2.78	0.21	370
Associate diploma	7.5	2.26	0.13	2.04	0.14	715
Skilled vocational	19.1	1.28	0.06	1.58	0.06	1720
Basic vocational	5.7	1.79	0.13	1.73	0.13	521
Final year secondary	15.5	1.53	0.08	1.56	0.08	1446
Some secondary	31.6	0.89	0.04	1.22	0.05	2916
Occupation						
Managerial	9.5	2.80	0.13	2.56	0.14	900
Professional, Para-prof & Tech.	24.4	3.09	0.09	2.16	0.09	2336
Trade	15.7	0.89	0.05	1.55	0.08	1389
Clerical	18.4	1.53	0.06	1.48	0.07	1774
Sales & personal	10.9	1.58	0.10	1.99	0.10	1001
Operator	9.4	0.84	0.09	1.38	0.10	851
Labourer	11.7	0.52	0.05	1.04	0.06	1058

Continued

Table 2 *Number of Training Courses During the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)*

Variable	Prop	Observed		Adjusted		N
	%	mean	se	mean	se	
Time in occupation						
Less than 3 months	2.3	0.80	0.15	1.17	0.20	223
3 months & under 6 months	3.1	0.79	0.10	0.99	0.16	279
6 months & under 1 year	6.5	1.22	0.12	1.44	0.15	595
1 year & under 2 years	9.9	1.61	0.11	1.71	0.10	934
2 years & under 3 years	9.4	1.81	0.12	1.77	0.11	871
3 years & under 5 years	19.4	1.69	0.08	1.71	0.07	1768
5 years & under 10 years	23.3	1.83	0.07	1.78	0.07	2180
10 years & under 20 years	17.8	1.97	0.08	1.87	0.08	1688
20 or more years	8.3	2.38	0.04	2.26	0.15	771
Time with employer						
Less than 3 months	2.7	1.24	0.16	1.92	0.20	252
3 months & under 6 months	3.1	1.53	0.20	2.08	0.23	284
6 months & under 1 year	4.9	1.51	0.14	1.75	0.19	463
1 year & under 2 years	8.5	1.79	0.12	1.75	0.11	790
2 years & under 3 years	8.3	1.91	0.12	1.75	0.11	777
3 years & under 5 years	17.8	1.81	0.09	1.82	0.08	1628
5 years & under 10 years	23.5	1.79	0.08	1.77	0.07	2185
10 years & under 20 years	19.9	1.81	0.07	1.68	0.08	1875
20 or more years	11.3	1.65	0.09	1.63	0.10	1055
Sector						
Public	32.7	2.63	0.07	1.89	0.08	3299
Private	67.3	1.33	0.04	1.69	0.05	6010
Industry						
Mining & agriculture	3.3	1.46	0.17	1.74	0.17	314
Manufacturing	20.4	0.99	0.06	1.48	0.07	1767
Utilities & construction	6.7	1.21	0.10	1.64	0.09	596
Retail & wholesale	16.9	1.16	0.06	1.61	0.08	1519
Transport & communication	7.6	1.36	0.09	1.46	0.10	705
Finance, insurance & property	11.8	2.13	0.12	2.01	0.12	1052
Pub. admin, defence, HEW	26.6	2.86	0.08	2.07	0.08	2919
Entertainment	4.7	1.14	0.10	1.53	0.14	437
Size of firm (No. employees)						
Less than 10	12.1	0.60	0.06	1.15	0.11	1084
10-19	6.1	0.85	0.10	1.12	0.13	565
20-99	13.5	1.44	0.09	1.49	0.09	1243
100 or more	68.3	2.10	0.05	1.97	0.05	6417

Table 2 Number of Training Courses During the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)

Variable	Prop	Observed		Adjusted		N
	%	mean	se	mean	se	
Size of loc. (No. employees)						
Less than 10	19.2	1.02	0.06	1.60	0.10	1749
10-19	11.8	1.45	0.10	1.77	0.11	1115
20-99	29.0	1.89	0.07	1.79	0.07	2694
100 or more	40.0	2.09	0.06	1.79	0.07	3751
Location						
Metropolitan	69.1	1.76	0.04	1.73	0.04	6594
Non-metropolitan	30.9	1.73	0.06	1.82	0.06	2715

See the Notes to Table 1.

Table 3 Hours of Formal Training Courses in the Previous 12 Months: Full-time Permanent Employees, 1993

Variable	Prop	Observed		Adjusted		N
	%	mean	se	mean	se	
Sex						
Male	65.4	23.5	0.82	24.1	0.81	5934
Female	34.6	22.0	1.00	20.9	0.96	3375
Age						
15-19	4.6	18.6	5.18	25.6	4.40	398
20-24	14.6	17.3	1.46	19.9	1.67	1287
25-29	15.5	22.0	1.41	22.3	1.48	1420
30-44	40.5	27.0	0.92	25.3	0.91	3901
45-55	18.7	23.7	1.81	22.8	1.56	1740
56-65	6.1	13.6	1.40	15.2	1.52	563
Country of birth						
English-speaking	86.2	23.9	0.70	23.6	0.55	8109
Non-English-speaking	13.8	17.6	2.01	19.2	2.20	1200
Education						
Postgraduate	5.8	41.3	2.59	30.2	3.31	566
Bachelor's degree	10.9	38.4	1.64	31.5	2.41	1055
Undergraduate diploma	3.9	37.1	3.67	29.0	3.66	370
Associate diploma	7.5	32.5	2.36	29.7	2.72	715
Skilled vocational	19.1	18.2	1.14	22.0	1.42	1720
Basic vocational	5.7	23.6	3.51	24.7	3.38	521
Final year secondary	15.5	23.4	2.38	22.2	2.02	1446
Some secondary	31.6	12.9	0.88	17.0	1.02	2916
Occupation						
Managerial	9.5	40.4	3.06	36.0	3.06	900
Professional, Para-prof & Tech.	24.4	35.5	1.46	27.5	1.84	2336
Trade	15.7	13.9	1.32	19.2	1.77	1389
Clerical	18.4	21.6	1.53	21.3	1.65	1774
Sales & personal	10.9	18.6	1.31	25.0	1.59	1001
Operator	9.4	14.1	2.60	18.7	2.89	851
Labourer	11.7	8.3	1.00	12.4	1.33	1058

Continued

Table 3 Hours of Formal Training Courses in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)

Variable	Prop	Observed		Adjusted		N
	%	mean	se	mean	se	
Time in occupation						
Less than 3 months	2.3	18.4	4.42	15.9	5.65	223
3 months & under 6 months	3.1	18.4	5.78	14.4	4.36	279
6 months & under 1 year	6.5	24.3	3.48	23.2	3.36	595
1 year & under 2 years	9.9	19.7	1.62	22.7	1.78	934
2 years & under 3 years	9.4	20.4	1.31	21.5	1.45	871
3 years & under 5 years	19.4	22.3	1.66	22.2	1.47	1768
5 years & under 10 years	23.3	20.9	1.01	21.4	1.23	2180
10 years & under 20 years	17.8	25.4	1.47	25.1	1.60	1688
20 or more years	8.3	34.2	3.80	32.0	4.07	771
Time with employer						
Less than 3 months	2.7	30.4	5.91	40.7	7.38	252
3 months & under 6 months	3.1	30.3	6.31	33.3	5.19	284
6 months & under 1 year	4.9	32.8	3.79	32.4	4.34	463
1 year & under 2 years	8.5	21.2	1.46	21.9	1.59	790
2 years & under 3 years	8.3	24.4	2.11	23.1	2.06	777
3 years & under 5 years	17.8	24.9	1.79	25.3	1.54	1628
5 years & under 10 years	23.5	20.9	1.20	22.0	1.52	2185
10 years & under 20 years	19.9	22.1	1.55	19.6	1.80	1875
20 or more years	11.3	18.1	1.17	17.0	1.55	1055
Sector						
Public	32.7	34.1	1.43	25.9	1.82	3299
Private	67.3	17.6	0.68	21.6	0.78	6010
Industry						
Mining & agriculture	3.3	26.3	5.81	26.6	5.34	314
Manufacturing	20.4	14.3	1.00	20.2	1.17	1767
Utilities & construction	6.7	17.9	2.21	21.1	2.12	596
Retail & wholesale	16.9	15.1	1.20	21.0	1.39	1519
Transport & communication	7.6	23.8	1.72	22.5	1.74	705
Finance, insurance & property	11.8	28.0	2.73	26.2	2.94	1052
Pub. admin, defence, HEW	26.6	33.6	1.48	25.4	1.58	2919
Entertainment	4.7	15.6	2.00	20.7	1.95	437
Size of firm (No. employees)						
Less than 10	12.1	8.2	1.05	14.5	2.12	1084
10-19	6.1	9.0	1.12	11.8	2.82	565
20-99	13.5	17.1	1.53	19.0	1.82	1243
100 or more	68.3	28.0	0.91	26.3	0.82	6417

Table 3 Hours of Formal Training Courses in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)

Variable	Prop	Observed		Adjusted		N
	%	mean	se	mean	se	
Size of loc. (No. employees)						
Less than 10	19.2	13.9	1.04	21.4	1.78	1749
10-19	11.8	19.1	2.23	24.0	3.27	1115
20-99	29.0	23.6	1.27	22.5	1.31	2694
100 or more	40.0	28.1	1.25	23.8	1.37	3751
Location						
Metropolitan	69.1	22.8	0.79	22.3	0.63	6594
Non-metropolitan	30.9	23.5	1.36	24.5	1.18	2715

See the Notes to Table 1.

Table 4 *Participation in On-the-job Training in the Previous 12 Months: Full-time Permanent Employees, 1993*

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	*se*	%	*se*	
Sex						
Male	65.4	83.3	0.6	85.0	0.5	5934
Female	34.6	88.6	0.6	85.5	0.7	3375
Age						
15-19	4.6	97.0	1.0	94.7	1.4	398
20-24	14.6	93.6	0.7	89.8	1.1	1287
25-29	15.5	89.4	1.0	87.5	0.8	1420
30-44	40.5	86.7	0.6	86.3	0.5	3901
45-55	18.7	77.7	1.1	80.6	1.1	1740
56-65	6.1	59.9	2.2	66.8	2.4	563
Country of birth						
English-speaking	86.2	86.2	0.4	85.6	0.4	8109
Non-English-speaking	13.8	78.4	1.3	82.0	1.2	1200
Education						
Postgraduate	5.8	93.3	1.0	88.9	1.5	566
Bachelor's degree	10.9	94.7	0.8	88.4	1.1	1055
Undergraduate diploma	3.9	94.0	1.3	88.6	1.6	370
Associate diploma	7.5	91.2	1.2	91.0	1.2	715
Skilled vocational	19.1	80.4	1.0	84.1	1.0	1720
Basic vocational	5.7	91.6	1.5	88.9	1.6	521
Final year secondary	15.5	89.7	0.9	85.9	0.8	1446
Some secondary	31.6	77.3	0.9	81.1	0.8	2916
Occupation						
Managerial	9.5	89.5	1.1	89.3	1.2	900
Professional, Para-prof & Tech.	24.4	94.2	0.6	91.2	0.9	2336
Trade	15.7	81.1	1.1	82.8	1.3	1389
Clerical	18.4	88.6	0.8	87.2	0.9	1774
Sales & personal	10.9	85.1	1.2	84.7	1.3	1001
Operator	9.4	70.3	1.8	75.3	1.6	851
Labourer	11.7	74.7	1.4	77.2	1.4	1058

Continued

Table 4 *Participation in On-the-job Training in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)*

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	se	%	se	
Time in occupation						
Less than 3 months	2.3	92.2	2.0	85.6	2.5	223
3 months & under 6 months	3.1	93.7	1.3	89.4	1.8	279
6 months & under 1 year	6.5	92.9	1.0	88.8	1.4	595
1 year & under 2 years	9.9	91.8	0.9	87.1	1.2	934
2 years & under 3 years	9.4	87.8	1.4	85.6	1.2	871
3 years & under 5 years	19.4	87.0	0.9	85.1	1.0	1768
5 years & under 10 years	23.3	83.2	0.8	84.1	0.7	2180
10 years & under 20 years	17.8	78.4	1.2	82.1	1.0	1688
20 or more years	8.3	78.6	1.6	87.1	1.6	771
Time with employer						
Less than 3 months	2.7	97.7	0.9	93.5	1.8	252
3 months & under 6 months	3.1	95.2	1.3	88.6	1.5	284
6 months & under 1 year	4.9	95.3	1.0	90.7	1.3	463
1 year & under 2 years	8.5	94.8	0.9	90.7	1.0	790
2 years & under 3 years	8.3	88.7	1.5	86.4	1.2	777
3 years & under 5 years	17.8	89.2	0.8	87.9	0.8	1628
5 years & under 10 years	23.5	83.8	0.8	84.4	0.9	2185
10 years & under 20 years	19.9	79.8	1.1	82.3	1.1	1875
20 or more years	11.3	70.7	1.4	76.8	1.5	1055
Sector						
Public	32.7	88.5	0.6	85.8	0.8	3299
Private	67.3	83.5	0.5	84.8	0.5	6010
Industry						
Mining & agriculture	3.3	87.9	2.2	92.7	1.9	314
Manufacturing	20.4	78.7	1.0	84.0	1.1	1767
Utilities & construction	6.7	85.0	1.6	86.2	1.6	596
Retail & wholesale	16.9	81.9	1.1	82.8	1.1	1519
Transport & communication	7.6	80.9	1.8	84.1	1.5	705
Finance, insurance & property	11.8	91.2	0.9	86.0	1.2	1052
Pub. admin, defence, HEW	26.6	90.0	0.6	86.5	1.0	2919
Entertainment	4.7	85.3	1.7	83.2	1.7	437
Size of firm (No. employees)						
Less than 10	12.1	81.0	1.3	80.7	1.8	1084
10-19	6.1	86.7	1.6	86.1	1.7	565
20-99	13.5	83.8	1.1	83.5	1.3	1243
100 or more	68.3	86.0	0.4	86.2	0.5	6417

Table 4 ***Participation in On-the-job Training in the Previous 12 Months: Full-time Permanent Employees, 1993 (continued)***

Variable	*Prop*	*Observed*		*Adjusted*		*N*
	%	%	*se*	%	*se*	
Size of loc. (No. employees)						
Less than 10	19.1	83.2	0.9	86.0	1.5	1749
10-19	11.8	87.0	1.1	85.5	1.2	1115
20-99	29.0	86.0	0.8	85.6	0.7	2694
100 or more	40.0	84.9	0.6	84.3	0.8	3751
Location						
Metropolitan	69.1	85.2	0.5	85.0	0.5	6594
Non-metropolitan	30.9	85.1	0.8	85.5	0.7	2715

Notes:

1 *On-the-job training includes being shown how to do the job, watching others work, asking questions of co-workers, and teaching self.*

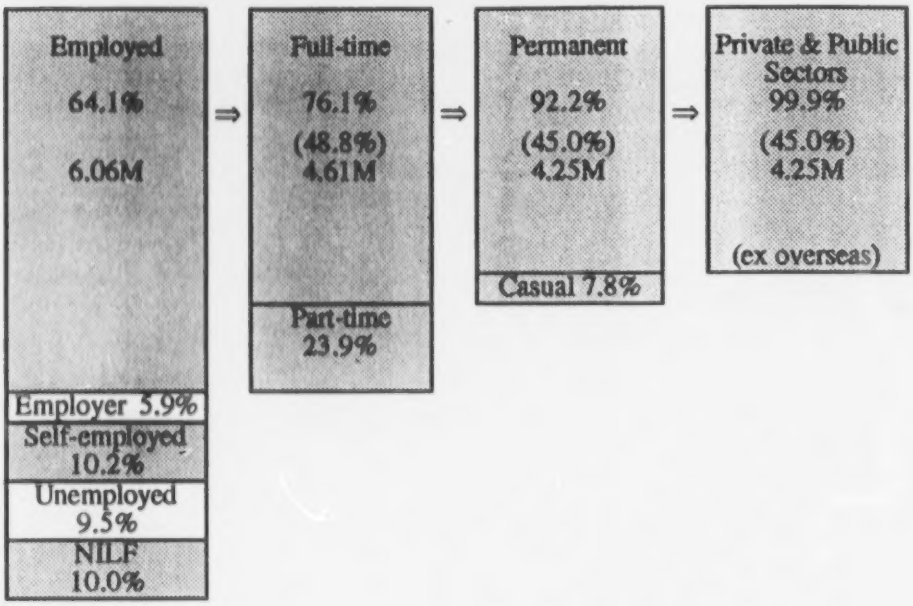
2 *See Notes 2-5 for Table 1.*

Table 5 *Summary of Relationships between Training and Back-ground Variables, Full-time Permanent Employees, 1993*

	In-house and External Courses			*On-the-job Training*
Variable	*Participation %*	*No. of courses Mean*	*Hours of training Mean*	*Participation %*
Sex	No difference	Females > Males	Males > Females	No difference
Age	Increases with age up to 30-44 group, then declines with age	Increases with age up to 30-44 group, then declines	Highest in 15-19 & 30-44 groups; declines with age	Declines with age
County of birth	ESB > NESB	ESB > NESB	ESB > NESB	ESB > NESB
Education	Generally positive	Positive	Positive	Generally positive
Occupation	Generally positive relation with occ status; trades low	Generally positive relation with occ status; sales & personal high	Generally positive relation; trades low, sales & personal high	Positively related to occ status
Time in occupation	Positive	Positive	Slightly positive	Generally positive
Time with employer	1-3 years high; > 10 yeas low	No relationship	<1 year high; >10 years low	Negative
Sector	Public > Private	No difference	No difference	No difference
Industry	High in mining & agric and public admin.; low in manuf, and retail	Low in manuf, transport, entertainment; high in finance, public admin.	Low in manuf; high in finance, public admin.	High in mining & agric. finance, and public admin.; low in retail
Size of firm	Positive	Positive	Positive	Generally positive
Size of location	No relationship	No relationship	No relationship	No relationship
Location	Non-metro > Metro	No difference	No difference	No difference

Note: The relationships shown are those found to have been statistically significant (t-value >1.96) after controlling for the value of the other variables in the table.

Figure 1 ***Proportions of the Total Sample of the 1993 Survey of Training and Education Included in the Present Study***



Notes:

1 *Figures in parentheses show the weighted percentage of the total sample retained when selecting permanent full-time employees in the public and private sectors for analysis.*

2 *A small proportion of missing responses for Sector of employment was dealt with by random imputation.*

3 *Numbers followed by M show the number of persons in millions represented by the corresponding category.*

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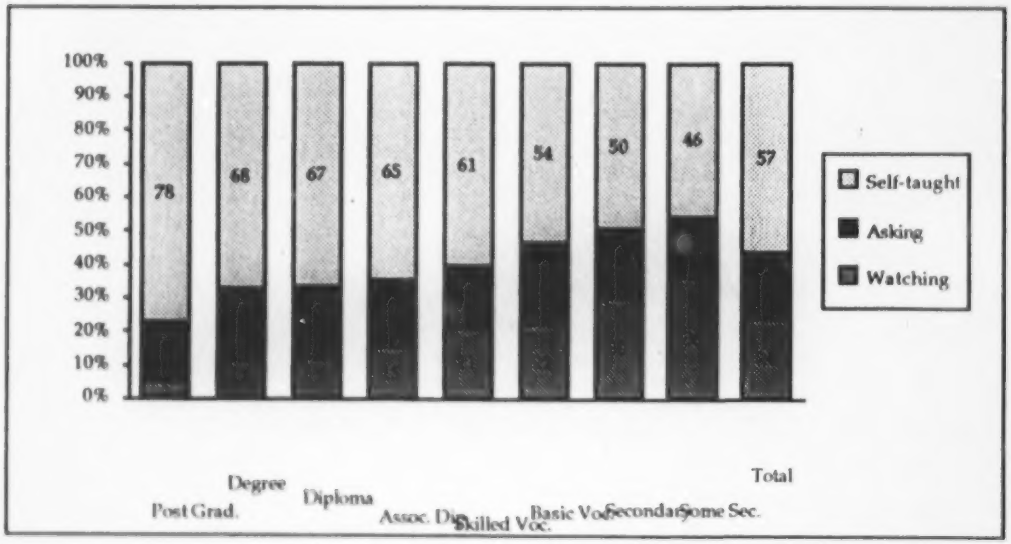
Figure 2 *Main Form of On-the-job Training by Highest Level of Educational Attainment: Full-time Permanent Employees Who Received Some On-the-job Training During the Previous 12 Months, 1993*



Note: Watching *includes being shown how to do the job and watching others work;* Asking *is asking questions of co-workers, and* Self-taught *is teaching self.*

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